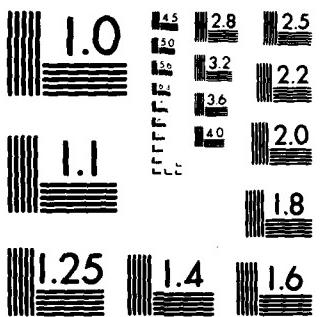


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Constance U. Greaser

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WRITERS, EDITORS, AND COMPUTERS*

Constance U. Greaser
Head, Publications Department

It's easy to dream about how marvelous the future will be for publishers, writers, and editors; it's usually quite a different matter to make those dreams come true. Occasionally others will say to me, "It must be paradise working in a research environment with in-house computer experts who can solve your problems." Actually, I have the same difficulty the rest of you do. My frustration level may be even higher, because I am indeed surrounded by brilliant computer scientists, but solving publication production problems just isn't very high on their priority list. Along with everyone else, I'm faced with meeting daily deadlines with resources that are completely operational today; there is usually quite a gap between that reality and our dreams!

I've spent some time recently trying to get information on the way computers and new technologies are affecting the writing and editing processes. There are data available on newspaper reporters who use terminals instead of typewriters, and there are, of course, plenty of statistics on how computers have aided the composition process. But I couldn't find anything about the ways in which book and journal authors and editors are using computers to make their lives easier. Thus, this presentation reflects only my own experiences at The Rand Corporation in Santa Monica, California. Some of you may be doing things in a far more sophisticated manner than we are, but for those of you who are not yet staring at screens instead of typewriters, this discussion may provide an overview of both the problems and the promise of computerized publishing.

Inputs and Outputs

The writer and editor need not completely understand the architecture of the computer environment in which they are working. In fact,

* This paper was presented at the Second Annual Meeting of the Society for Scholarly Publishing in Minneapolis, Minnesota, on June 1-3, 1980.

we have found that the simpler the system appears, the more comfortable first-time users are. A very simplified view of Rand's text editing system is shown in Fig. 1.

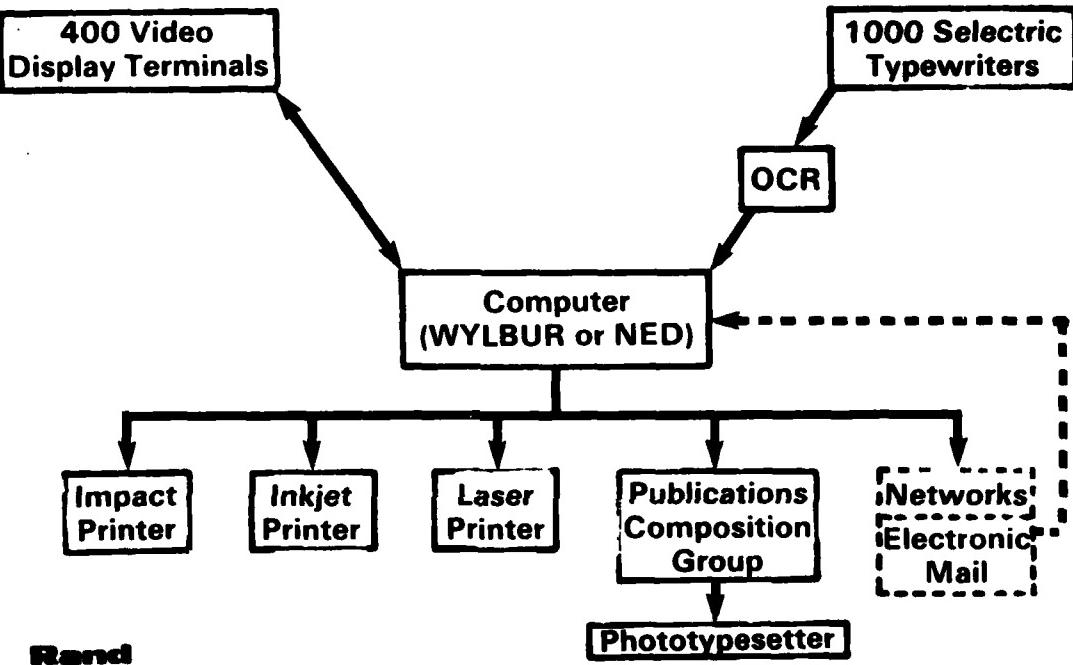


Fig. 1--Simplified writer/editor view
of Rand's computer system

There are two ways to get material into the computer: users can operate one of the terminals in a public room, or a terminal can be wheeled into an office and plugged into a computer port which is already installed in most offices. Computer files can also be created by scanning typewritten material with an optical character reader (OCR). In this way any typewriter that has a prestige elite font becomes, in effect, an input device.

Although we are moving toward "paperless" processing at Rand, most manuscripts still reach us in traditional typewriter form. We occasionally still get handwritten manuscripts. We even have a few authors

who first published their thoughts 25 years ago using orange-carbon-backed vellum paper, and prefer that method to this day. But more and more manuscripts are reaching us in the form of a computer data file. Authors simply give us access to the computer files where their manuscripts are stored, and we copy them into working data sets for publication processing.

A few years ago, a data file was a relatively rare way to transmit a manuscript. In 1978 about 5 percent of the manuscripts reached us in computer form. By 1979 the figure had grown to about 20 percent. Thus far in 1980, over one-third of the manuscripts submitted to us are already in the computer. An increasing number of the manuscripts that are not already in computer form are at least OCR scannable, so many of the manuscripts turned over to our editorial staff are ready for computerized management. And more and more of our editors are using the computer to assist them.

Most writers and editors know little about "mainframes" or "minis" or "operating systems" or other important components of the actual system architecture. They are simply aware that there are two different on-line text editing systems "out there someplace in the computer" to assist them, and they have received a couple of hours of simple instructions on the proper use of one of them. WYLBUR, the older of our text editors, is a line-oriented system that has been running on Rand's IBM equipment for a dozen or more years--long enough to be debugged and documented. The second system is called NED, which stands for New EDitor. It is a developmental editor running on DEC equipment under the UNIX operating system. Based on cursor technology, NED has gained great popularity at Rand since its introduction a few years ago. The coupling of NED with a variety of text-formatting programs available under UNIX gives the user a full-blown word processor.

Writers and editors may choose the output device that best meets their needs. The impact printer provides cheap, quick printout of non-reproducible quality. The inkjet and laser printers produce monospaced type that looks typewritten; the inkjet is slow but handles equations, subscripts, and superscripts quite well, while the laser is fast and pro-

duces type in several sizes. (Both the inkjet and laser are capable of producing proportional spaced type, but our software isn't smart enough yet.) If the document is to be phototypeset, it must be electronically sent to the Publications Department for output. Rand authors can also use the computer networks to send their draft manuscripts, as well as memos and notes, to colleagues at other institutions.

Writers and the Computer

The computer will never replace creativity, but at Rand it certainly adds flexibility to creativity and speeds up the process. Many of our authors use the computer exactly as they would a typewriter, but they know that this "typewriter" allows them to correct typos easily, rework sentences, and move copy around with a simple command. Authors frequently prepare perfect drafts without any secretarial assistance and then send the draft electronically over the network to the client and to colleagues for technical review. While considering the review comments, the author updates the manuscript so that again a perfect copy exists to send on for publication processing (editing, art, photocomposition, printing, and distribution). The savings in secretarial and Publications Department costs and time are significant.

Unfortunately, the review process is seldom as simple as I've just made it sound. At Rand, a manuscript may go through five or more revisions before reaching the Publications Department for processing, and the closeness of the author to the publishing operation invites constant changes before the manuscript is ready for printing. In 1979 we averaged three major correction passes per manuscript--that was the bad news. The good news was that the computer made each of these revision cycles easier, quicker, and less costly.

To give you a brief idea of the way we use the computer to aid the writing process, I gathered some data on a two-volume semiannual report we do for one of our major sponsors. Because we have done this report for a number of years, we have historical data on costs and preparation time before we started using the computer.

This report contains detailed descriptions of research programs under way, and a shorter projection of future research. It also lists the publications that have appeared, visits to and from prominent people within the client's organization, briefings given on behalf of the client, etc. This latter "housekeeping" information was formerly stored in card files or manila folders in the form of informal notes, handwritten tidbits, carbon copies of letters, and travel orders. Twice a year this material was laboriously sorted by hand in order to produce the report. Now the senior editor spends several hours per week throughout the year typing this information into the computer. The weeks of sorting and duplicating all this information when the actual writing begins are now gone; a few simple commands provide program managers with up-to-the-minute, relevant information for this review. We also automatically prepare those sections of the report that contain the complete list of publications (with abstracts) and briefings.

In the process of producing each report, a series of memos requesting information and program write-ups goes to about fifteen people. The computer automatically produces these memos, along with lists of needed information and appropriate deadlines. In addition, the memo recipients are provided with a copy of the write-ups from the last report and with all recent information that has been "filed away." Because most of the input received in response to the memos is already in the computer, or is at least scannable by the OCR, it is easily integrated into a first draft, edited, and made ready to send out for review. Previously it took about a week to incorporate reviewers' changes and send out revised, clean, typewritten drafts; this whole process now takes about four hours. As you might expect, there are now more revision rounds, but a better quality product eventually results. All this is done in about 25 percent less time than it used to take, at more than a 30 percent cost saving.

Editors and the Computer

Authors are using the computer to add flexibility to their creativity. Editors use the computer both to enhance their creative role and to handle mundane editorial chores, while at the same time producing publications more quickly and cheaply.

Even when we receive a perfect data file, our editors almost always request a line-numbered, double-spaced printout and use a red pencil to edit in the conventional manner. The editor sends the marked-up manuscript to the author for approval, and when it is returned, the composition group--or in some cases the editor--will add the corrections to the file along with simple, mnemonic typesetting codes.

Our system of mnemonic and implied coding for phototypesetting is easy for editors to use. Most codes are two digits (i.e., H1 is the first order head, H2 is a second order head, etc.), and they appear in the extreme left margin where they can be easily suppressed during output if desired. Actually, we seldom suppress the codes any more since both editors and authors frequently use the codes to keep track of where they are in the manuscript, just as they would use an outline.

Until just recently, users of the NED text processing system developed their own method of encoding data files for output on the inkjet and laser printers. Our programming staff has developed a new, simplified set of standard codes and formatting instructions (called "macros" by NED users). There are two benefits to using these Rand macros. First, the output pages from either of the printers match Rand's traditional typing format, and a minimum amount of coding is needed for rough draft revision formatting. Second, we have also developed a program that can convert these standard Rand macros into phototypesetting codes; the program does about 95 percent of the markup necessary to get a file ready for phototypesetting into complete pages.

Occasionally, when manuscripts are short and well written, editors work with a computerized manuscript directly on the video display terminal without creating a double-spaced printout. However, editors generally just don't care to stare at a cathode ray tube for eight hours a day, especially when printouts are so easily transportable and can be edited in the bathtub, on the beach, or in an airplane.

Since the computer always produces a "perfect" manuscript, one of the most difficult problems associated with editing on the terminal is that of showing the editorial changes to the author for his or her acceptance. Some features of Rand's text processing system mitigate the problem

somewhat. One routine allows us to print out only the changed portions of the manuscript, but it is difficult for the author to put these changes into context. Another routine allows us to insert marginal comments and changes directly in the text stream and flag them for the author. The author can review changes by jumping from flag to flag; however, in a heavily edited manuscript, this process can be a nuisance. None of these methods compares with the convenience of a printout edited in red pencil; the author can quickly scan the changes and concentrate on those that may potentially affect meaning. We have been trying to develop a better way to handle this essential author/editor interaction via computer, but so far we're not even close to giving up our red pencils and printouts!

Similarly, complications arise in the Publications Department when the author takes our "perfect" file (which has been edited and coded for phototypesetting) and inserts changes that we can't see. Checking these changes is just as difficult for us as it is for the author, and the situation is made even worse when the last-minute tinkering results in undetected changes in the phototypesetting codes. One author complained about hyphens and spaces in words in the middle of some phototypeset lines; we found that last-minute changes made by his secretary contained hyphenated words at the end of computer lines. An even worse problem occurred when an author, without telling us, introduced some invisible format codes into our file because he wanted a clean laser copy. Unfortunately, the phototypesetter interpreted some of these invisible laser format codes as a command to drop the next two lines of text! We've tried to control these potential disasters by not allowing the author access to the Publications Department file after we've copied the author's original data file. And we limit editor access after phototypesetting codes are added to the file.

Worst of all, however, is the poor author who is completely naive about the philosophy of data file management. This author continues to make changes in the original file copy, even after notification that we've copied it and have created our own file. He becomes genuinely confused upon learning that the late corrections he added to his original file didn't get into the final report which was typeset from the Publications Department's file.

Now that I've touched on some of the disadvantages of editing on the computer, let me give equal time to some of the advantages. The most obvious advantages at Rand are the savings in time and cost of publishing documents. Editors also point out that the computer is fun and relieves them of some of the more mundane editorial tasks like maintaining basic consistency throughout the manuscript or making "global" changes (such as changing all instances of one spelling to another).

There are many simple computer programs that can make the editor's life easier. For example, we have an experimental KWIC (Key Word in Context) program that can help us compile back-of-book indexes; an ancillary feature is that when all the words in the manuscript are compared and an alphabetical list is created, typographical errors really pop out. We will still have to proofread for sense and for grammatical errors, but the proofreader's job can become considerably easier.

Many commercial text processing systems these days have "electronic dictionaries" for proofreading, and some even have "fog indexes" to determine reading levels. The computer can't rewrite, but it can flag words and sentences that seem too complex for the predetermined audience level. The end result may eventually be simpler, better writing.

Of the twelve full-time editors on our staff, two use the computer extensively and four use it occasionally. The two who are on the computer continuously cite more than fun and cost-effectiveness as their reasons. They like the total control that they have over the production process, and they enjoy the freedom from typing and correction queues. Except for the art and the cover, the ability to meet deadlines is completely within their individual control.

Recently one of these editors received the file address of a detailed manuscript that described a new computer program. Since she was not terribly familiar with the author's writing, and because she wanted to take the manuscript home to work on, she created a double-spaced printout for editing. The author checked over the edited manuscript, and both the author and the editor interactively added changes, along with phototypesetting and pagination codes, to the data file. When they were both satisfied with the file, they bypassed our regular phototype-

setting procedures and sent the manuscript over ARPANET to a local university with a phototypesetter that handles complex math quite easily. By the time the author drove over to the university, the completed phototypeset pages were ready, with running heads and folios in place.

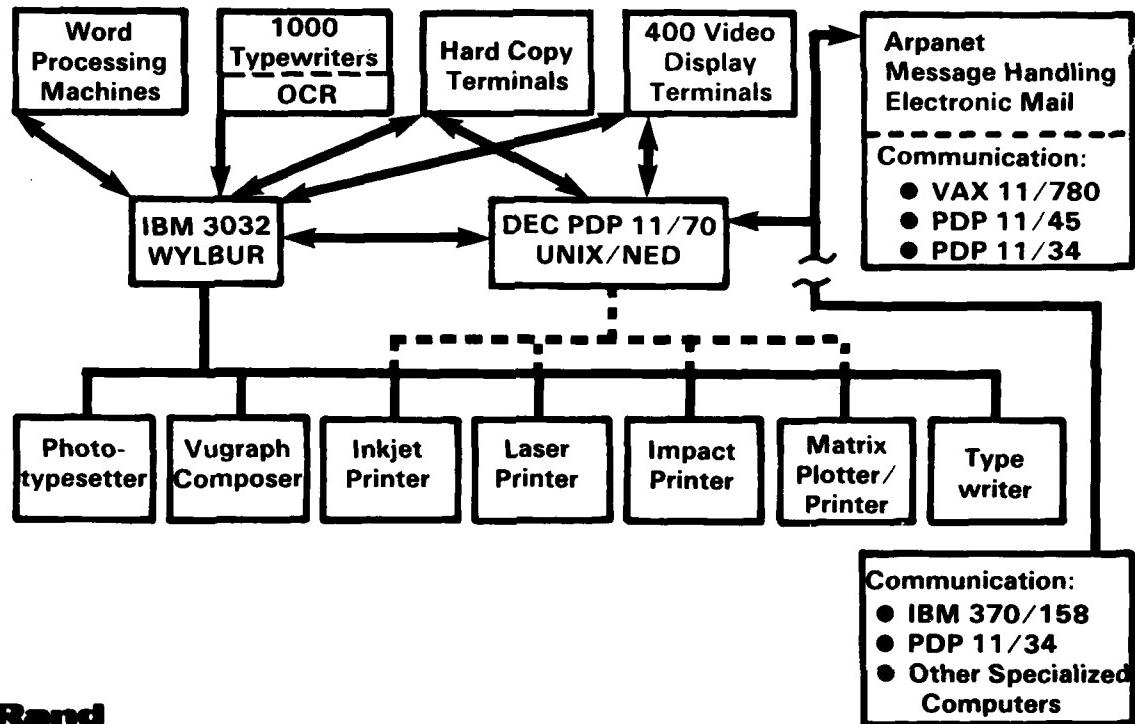
It can be misleading to compare publication costs and processing times because so much depends on such things as the personalities and skills of the author and editor, the subject matter, and the requirements of the client, but page costs for this particular document were 21 percent less than the average page cost for all documents produced for this client in 1979, and it was done in 65 percent of the average time.

Frequently I am asked what kind of editor seems to work best with the computer. There seems to be a general feeling that the younger, less-experienced members of an editorial group will welcome new techniques, while the older, experienced editors will reject them. I'm happy to report that this certainly is not the case at Rand, where neither age nor mechanical aptitude nor editorial ability seems important in the editors' decision to incorporate computer technology in their work. The editors who use the computer span the age, skill, and experience spectrum.

Computers and the Publishing Process

Computers are also helpful in other parts of the publishing operation at Rand. To understand this better, remember the writer's and editor's "very simplified view" of the computer system (Fig. 1). Those of you who are familiar with computer architecture already know that our system has to be a great deal more complicated than that. In fact, as director of the publication process, my view of the same system looks more like Fig. 2. (And if I were to have one of our information scientists sketch out the complete system, it would be even more complex.)

If the managers in the department are to do their jobs properly, they must understand how to select options that will save money or production days, how to handle non-standard job requirements, and how to keep work moving even if one of the components in the system is inoperable.



Rand

Fig. 2--Rand's computer system from the perspective of the Publications Department

For example, in addition to the display terminal and OCR that the writers and editors use, there are other ways to get information into the computer. Within the department we have stand-alone word processors, and most of our typists prefer to work on these machines. When a cassette is full (about 30 typed pages), a flip of the switch on the word processor automatically transfers the material to the appropriate computer. Cost savings result since our computer charges are for the few minutes required to transfer the cartridge, not for the hours actually required to type the material.

Figure 2 also shows that instead of one computer which does all things for all people, Rand has several computer systems. Since they

all communicate, it doesn't make much difference to the user which computer is handling a specific task. The two on-line editing systems reside in two very different types of computers. If one of the computers is temporarily out of service, we can continue to operate with the other one and switch files back to the proper machine when it resumes operation.

Department personnel have many output options. For instance, there is a "black box" that writes floppy disks from the computer system. These disks then drive an off-line, second generation phototypesetter, which we use almost exclusively to prepare full-size, 11 x 8-1/2 vugraphs. Since vugraph preparation is no longer limited to the speed of a single typist on the phototypesetter keyboard, our total output is greatly increased. We can also use the computer to drive several specialized plotter-printers located throughout the corporation. One of these devices holds four different colored pens and writes on either paper or acetate; it can be used to automatically plot artwork for publications and vugraphs.

The computer has many uses in the publishing environment. We've known for a long time that it can help with phototypesetting and business activities such as fulfilling subscriptions, list and label processing, and invoicing. We're just beginning to understand the possibilities for writing, editing, drawing, design, and other creative functions. And the computer can help in almost all other jobs in our shops, such as estimating, scheduling, tracking, printing, and generating reports. A few brave souls are already venturing into new areas and rapidly moving toward a totally automated publishing office environment. Rather than fearing that they'll be replaced by a computer, most publishers know the new technology will make their lives easier. They really will be able to do things more quickly and cheaply, and they will have facts and figures instantly available so they can become more effective managers. They will also have more time to devote to the people in their operations, for in spite of the wonders of technology, the most important component in our publishing houses will always be the writers, editors, artists, and other "real people."